EXHIBIT A

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September 17, 2009

VIA FEDEX

Mr. Henri A. Termeer
Chairman of the Board, President
and Chief Executive Officer
Genzyme Corporation
500 Kendall Street
Cambridge, MA 02142

Re: Shareholder Demand

Dear Mr. Termeer:

This firm represents William and Edna Panzini (the "Stockholders"), holders of shares of common stock of Genzyme Corporation ("Genzyme" or the "Company"). I write on behalf of the Stockholders to demand that the Board of Directors of Genzyme (the "Board") take action to remedy breaches of fiduciary duties by the directors and certain executive officers of the Company, as described herein.

As you are aware, by reason of their positions as officers and/or directors of Genzyme, and because of their ability to control the business and corporate affairs of Genzyme, the officers and directors of the Company owe Genzyme and its shareholders the fiduciary obligations of loyalty, good faith and due care. The Stockholders believe that the following officers and/or directors of the Company violated these core fiduciary duty principles, causing Genzyme to suffer damages: Chairman of the Board, President and Chief Executive Officer Henri A. Termeer; Chief Financial Officer and Executive Vice President, Finance Michael S. Wyzga; Chief Medical Officer and Senior Vice President, Biomedical & Regulatory Affairs Richard A. Moscicki; Governance/Nominating Committee and Audit Committee members Douglas A. Berthiaume, Gail K. Boudreaux, Connie Mack III and Richard F. Syron; and Governance/Nominating Committee members Robert J. Carpenter, Charles L. Cooney and Victor J. Dzau (collectively, the "Officers and Directors").

Beginning in July 2007, Genzyme informed the Company's shareholders about the likely approval by the Food and Drug Administration ("FDA") of its 2000 L process for manufacturing Myozyme, known in its new formulation as Lumizyme. The large scale manufacturing of Myozyme/Lumizyme was critical for the Company to meet its 2008 earnings guidance and

projections. While manufacturing challenges with Myozyme/Lumizyme were identified in the Company's earnings releases, the Company nevertheless continued to assure shareholders that these "challenges" would be easily overcome, and assumed the approval of the 2000 L process in its guidance for 2008. The Stockholders contend that, in fact, the Officers and Directors knew that the "manufacturing issues and challenges" at Genzyme were much more severe than publicly acknowledged, and put FDA approval of Lumizyme in substantial jeopardy. During this time, certain of the Officers and Directors also embarked on a massive selloff of their personally held Genzyme stock on the basis of this material non-public information, as detailed in "Exhibit A" and attached hereto.

In April 2008, Genzyme reported that, as the Officers and Directors expected, it had failed to obtain FDA approval of Lumizyme. Instead, the FDA determined that it would require the 2000 L Myozyme to be submitted to independent trials because the Company's manufacturing of 2000 L Myozyme yielded enzymes with different characteristics than the smaller 160 L batches of Myozyme. Nonetheless, to quell investor unease, Genzyme said that it believed that the FDA's approval process would be accelerated based on the results of an international study (the LOTS study) on the efficacy of Lumizyme, and predicted its approval by the end of 2008.

In September 2008, the FDA inspected several of Genzyme's production facilities, including the Company's manufacturing facility in Allston, Massachusetts (the "Allston Facility"), and provided the Company with a list of practices that deviated from the FDA's Good Manufacturing Practice ("GMP") standards. The Company did not publicly disclose the FDA's inspection nor any of the problems that the FDA detailed to the Company in its inspection report, despite knowing that the FDA would not approve Lumizyme until all of the manufacturing problems were corrected by the Company. Genzyme also experienced instances of contamination at its manufacturing plants in the fall of 2008, including at the Allston Facility. Like the FDA's findings of Genzyme's GMP deviations, these instances of contamination were not disclosed to the Company's shareholders, even though these issues affected Genzyme's ability to meet consumer demand for Myozyme. This would subsequently lead to a supply shortage of the product in the marketplace to the extent that the Company would be forced to ration its distribution.

It was not until March 2, 2009 that Genzyme finally disclosed the FDA's findings and its concerns about the Company's deficient GMP standards. This belated disclosure did not come until after the Company had received a second reprimand from the FDA in the form of a "Warning Letter." Genzyme's March 2, 2009 disclosure finally revealed the manufacturing "issues" that the FDA had detailed to the Company nearly six months earlier, and also confirmed that the FDA would not approve Lumizyme until after the FDA's concerns were fully addressed.

On April 22, 2009, the impact of the prior contamination issues began to materialize when the Company disclosed that it was unable to manufacture sufficient quantities of Myozyme to meet consumer demand. On that day, the Company reported first quarter 2009 financial and operational results that were below analyst expectations. Genzyme partially attributed the Company's earnings shortfall to the Myozyme "supply constraints," but failed to disclose that the "supply constraints" were the result of the contamination and manufacturing problems at the

Company's facilities. Nevertheless, the Company reaffirmed its financial guidance for the year, and informed investors that it anticipated approval of Lumizyme "late in the second quarter or in the third quarter" of 2009.

On June 16, 2009, Genzyme announced that it had detected a virus that would further impede production of its biologics at the Allston Facility. The Company also announced that it was suspending production of some of its top-selling drugs, which were all manufactured at the Allston Facility, in order to sanitize the entire facility. The Allston Facility remained closed for the months of June and July 2009, and the Company was forced to ration Cerezyme and Fabrazyme to the marketplace due to their high demand and the Company's low inventory of the products.

In August 2009, Genzyme reported that the FDA needed to re-inspect the Company's Allston Facility another time, as at the time of the FDA's inspection in May 2009 the Company had failed to address all of the problems that the FDA had previously highlighted. Genzyme also stated that the FDA was going to examine all of the steps that the Company took to sterilize its equipment during the shutdown of the Allston Facility. More recently, on August 10, 2009, Genzyme reported that it was forced to scrap at least 80% of the ingredients and in-process materials for Cerezyme (with the potential of disposing of 100% of the materials), and stated that it did not expect new supply of the drug to be available until November 2009.

Finally, on September 1, 2009, *The Boston Globe* reported that the European Medicines Agency had recently inspected the Allston Facility and identified a "major deficiency" at the plant. This prompted one analyst to downgrade Genzyme's stock, and even go so far as to state that "While we have urged patience until now, we are surprised that there are still significant deviations at Allston this late in the game." The analyst also reported that fewer than 10% of European Medicines Agency observations have been characterized as "major," and lowered his Cerezyme estimates "considerably" through 2012 as he felt "that the odds of continued delays at Allston Landing and longer-lasting fallout of said delays are now higher."

The Stockholders contend that the Officers and Directors, and particularly the members of the Nominating/Governance and Audit Committees, breached their fiduciary duties by knowingly causing the Company to: (1) falsely portray that its manufacturing facilities were compliant with FDA standards; (2) conceal the manufacturing deficiencies previously flagged by FDA inspectors; (3) conceal the true reason for the Company's inability to meet demand for its products; (4) materially mislead the Company's shareholders about the expected product and revenue growth of Cerezyme, Fabrazyme, and Myozyme; (5) materially mislead the Company's shareholders about the approval schedule of Lumizyme; (6) conceal from shareholders that the Company lacked adequate internal controls; and (7) fail to take appropriate action to prevent or correct this misconduct. As a direct and proximate result of the Officers' and Directors' breaches of fiduciary duties, the Company has sustained damages, including, but not limited to, losses incurred in connection with lost and delayed sales of Cerezyme, Fabrazyme, Myozyme, and Lumizyme. The Stockholders also contend that certain of the Company's Officers and Directors took advantage of their knowledge of material non-public information about Genzyme to illegally sell tens of millions of dollars of their personally held Genzyme stock prior to shareholders learning the above adverse facts.

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On behalf of the Stockholders, I hereby demand that the Board take action against each of the Directors and Officers to recover the damages described herein for the benefit of the Company, to recover the proceeds of the illegal insider sales, and to correct the deficiencies in the Company's internal controls that allowed the misconduct to occur.

If within a reasonable period after receipt of this letter, the Board has not commenced an action as demanded herein, or in the event that the Board refuses to commence an action as demanded herein, the Stockholders will commence a shareholder derivative action on behalf of Genzyme seeking appropriate relief.

Very truly yours,

BARROWAY TOPAZ KESSLER
MELTZER & CHECK, LLP

Eric L. Zagar

ELZ/

EXHIBIT A

Name	Date of Sale	# Shares Sold	Price per Share	Gross Proceeds
Henri A. Termeer	5/26/2009	9,637	$56.54	$544,849.00
	12/7/2007	20,000	$72.40	$1,448,000.00
	10/30/2007	50,723	$73.56	$3,731,183.88
	10/29/2007	32,241	$75.06	$2,420,009.46
	10/29/2007	5,500	$74.00	$407,000.00
	10/29/2007	120,285	$73.53	$8,844,556.05
	10/26/2007	257,053	$75.07	$19,296,968.71
	Total:	**495,439**		**$36,692,567.10**
Peter Wirth	1/16/2009	232,180	$66.50	$15,439,970.00
	Total:	**232,180**		**$15,439,970.00**
Richard A. Moscicki	9/23/2008	36,635	$76.73	$2,811,003.55
	6/25/2008	36,635	$72.00	$2,637,720.00
	1/17/2008	45,793	$82.00	$3,755,026.00
	1/8/2008	45,793	$78.00	$3,571,854.00
	12/31/2007	21,334	$74.68	$1,593,223.12
	Total:	**186,190**		**$14,368,826.67**
Earl M. Collier, Jr	5/26/2009	1,641	$56.54	$92,779.68
	7/8/2008	16,200	$75.00	$1,215,000.00
	1/16/2008	90,000	$80.00	$7,200,000.00
	10/15/2007	32,400	$75.00	$2,430,000.00
	Total:	**141,011**		**$10,937,779.68**
Alan E. Smith	6/2/2009	1,809	$61.40	$111,064.82
	5/26/2009	885	$56.54	$50,036.31
	12/8/2008	55,521	$65.17	$3,618,303.57
	8/14/2008	15,000	$82.51	$1,237,650.00
	8/5/2008	27,761	$78.00	$2,165,358.00
	7/15/2008	18,455	$79.70	$1,470,863.50
	12/17/2007	20,000	$75.00	$1,500,000.00
	Total:	**140,121**		**$10,153,276.20**
Sandford D. Smith	5/26/2009	1,641	$56.54	$92,785.91
	1/16/2008	20,181	$79.70	$1,608,425.70
	1/11/2008	4,719	$79.70	$376,104.30
	1/9/2008	100	$79.70	$7,970.00
	10/15/2007	25,000	$74.77	$1,869,250.00
	10/10/2007	25,000	$69.80	$1,745,000.00
	Total:	**76,641**		**$5,699,535.91**

Name	Date of Sale	# Shares Sold	Price per Share	Gross Proceeds
Robert J. Carpenter	5/22/2009	1,000	$58.70	$58,700.60
	5/15/2009	1,452	$59.40	$86,243.86
	5/14/2009	10,000	$60.33	$603,277.00
	5/13/2009	10,000	$60.62	$606,238.00
	5/12/2009	2,548	$60.70	$154,652.64
	5/12/2009	7,452	$60.70	$452,304.36
	5/11/2009	10,000	$61.28	$612,775.00
	11/15/2007	18,543	$73.05	$1,354,566.15
	11/2/2007	1,219	$75.00	$91,425.00
	11/1/2007	17,324	$75.00	$1,299,300.00
	Total:	**79,538**		**$5,319,482.61**
Charles L. Cooney	6/1/2009	2,500	$59.40	$148,508.75
	5/13/2009	3,000	$60.19	$180,570.00
	4/24/2009	4,000	$53.35	$213,386.40
	2/23/2009	6,000	$69.69	$418,140.00
	5/2/2008	27,000	$70.67	$1,908,090.00
	Total:	**42,500**		**$2,868,695.15**
Georges Gemayel	10/30/2007	37,500	$76.00	$2,850,000.00
	Total:	**37,500**		**$2,850,000.00**
Michael S. Wyzga	8/12/2008	29,390	$79.00	$2,321,810.00
	12/17/2007	5,140	$74.89	$384,934.60
	Total:	**34,530**		**$2,706,744.60**
Mark R. Bamforth	8/14/2009	19,232	$81.71	$1,571,446.72
	8/6/2008	6,445	$79.00	$509,155.00
	7/15/2008	6,445	$79.00	$509,155.00
	Total:	**32,122**		**$2,589,756.72**
Douglas A. Berthiaume	11/4/2008	11,200	$74.59	$835,408.00
	5/21/2008	24,000	$67.71	$1,625,040.00
	Total:	**35,200**		**$2,460,448.00**
Victor J. Dzau	11/29/2007	5,000	$75.00	$375,000.00
	11/21/2007	10,000	$72.00	$720,000.00
	11/13/2007	10,000	$72.00	$720,000.00
	Total:	**25,000**		**$1,815,000.00**

Name	Date of Sale	# Shares Sold	Price per Share	Gross Proceeds
David Meeker	8/15/2008	17,790	$83.19	$1,479,950.10
	Total:	**17,790**		**$1,479,950.10**
Cornelius McGillicudy III	3/3/2008	19,900	$72.32	$1,439,168.00
	Total:	**19,900**		**$1,439,168.00**
Thomas DesRosier	8/7/2008	10,725	$78.99	$847,167.75
	Total:	**10,725**		**$847,167.75**
Zoltan Csimma	5/26/2009	638	$56.54	$36,069.46
	Total:	**638**		**$36,069.46**